University of Lethbridge

Program Planning Guide

Department: Physics and Astronomy

Calendar Year: 2015/2016

Name:_____

ID: _____

Bachelor of Science

Physics

Major in Physics:
www.uleth.ca/artsci/physics-astronomy

Academic Calendar:
www.uleth.ca/ross/academic-calendar

High School Prerequisites by Course:
www.uleth.ca/ross/hs_prereqs/course

Current and Past Program Planning Guides:
www.uleth.ca/ross/ppgs

Faculty of Arts and Science Student Program Services:
www.uleth.ca/artsci/advising
artsci.advising@uleth.ca
(403) 329-5106
SU060

Co-operative Education:
www.uleth.ca/artsci/coop

Name: _____ **ID:** _____

B.Sc. Physics

Completion of at least 40 courses (120.0 credit hours) with a grade point average of at least 2.00.

Major Requirements (26 courses)

_____ 1. Chemistry 1000 - General Chemistry I
_____ 2. Computer Science 1620 - Fundamentals of Programming I
_____ 3. Mathematics 1410 - Elementary Linear Algebra
_____ 4. Mathematics 1560 - Calculus I
_____ 5. Mathematics 2560 - Calculus II
_____ 6. Mathematics 2570 - Calculus III
_____ 7. Mathematics 2580 - Calculus IV
_____ 8. Physics 2000 - Introduction to Physics II
_____ 9. Physics 2120 - Introduction to Physics III
_____ 10. Physics 2130 - Waves, Optics and Sound
_____ 11. Physics 2150 - Quantum Mechanics I
_____ 12. Physics 2800 - Methods in Mathematical Physics
_____ 13. Physics 2925 - Introduction to Experimental Physics
_____ 14. Physics 3150 - Quantum Mechanics II
_____ 15. Physics 3175 - Electricity and Magnetism
_____ 16. Physics 3200 - Mechanics
_____ 17. Physics 3400 - Thermal and Statistical Physics
_____ 18. Physics 3750 - Contemporary Physics
_____ 19. Physics 3800 - Methods of Theoretical Physics
_____ 20. Physics 3925 - Experimental Physics
_____ 21. Physics 4175 - The Electromagnetic Interaction

_____ 22. **One of:**
- _____ Biology 1010 - Cellular Basis of Life
- _____ Biology 1020 - Diversity of Life

_____ 23. **One of:**
- _____ Physics 1000 - Introduction to Physics I
- _____ Physics 1050 - Introduction to Biophysics
- _____ [1]Engineering 2060 - Engineering Mechanics

_____ 24. **One of:**
- _____ Physics 4150 - Quantum Mechanics III
- _____ Physics 4200 - Advanced Mechanics

_____ 25-26. **Two of:**[2]
- _____ Physics 3650 - Optics
- _____ Physics 3840 - Introduction to Computational Physics
- _____ Physics 3900 - Intermediate Experimental Physics (Series)
- _____ Physics 4000 - Advanced Studies in Physics (Series)
- _____ Physics 4100 - Nuclear and Particle Physics
- _____ Physics 4250 - Solid State Physics
- _____ Physics 4650 - Physics of Remote Sensing

Other Courses (minimum 14 courses)

1. _____ 8. _____
2. _____ 9. _____
3. _____ 10. _____
4. _____ 11. _____
5. _____ 12. _____
6. _____ 13. _____
7. _____ 14. _____

Notes

[1]*Engineering 2000 and Mathematics 1560 are prerequisites for Engineering 2060.*

[2]*Offerings in Physics 3850 (Topics) and Physics 4850 (Topics) and either Physics 4150 or Physics 4200 (if not used above) may be used to satisfy this requirement.*

Since a number of courses are offered only on alternate years, students are advised to plan carefully to include the desired courses. In all cases, students (especially those planning for advanced studies in Physics) are encouraged to seek advice on their programs from any member of the Department of Physics and Astronomy.

It is recommended that students majoring in Physics include in their program courses in Biology, Chemistry, Computer Science, and Mathematics.

It is strongly recommended that a student attain a grade of 'C' or higher in any course used to satisfy prerequisites for courses in Physics and Mathematics.

See also:

- Bachelor of Science - Remote Sensing
- Bachelor of Science/Bachelor of Education - Physics/Science Education
- Bachelor of Science/Bachelor of Management - Physics

Completion of the General Liberal Education Requirement (GLER).
Only four courses (12.0 credit hours) in total may be counted from all courses offered by a single department. See the 2015/2016 Calendar, p. 83, for more information.

LIST I: Fine Arts and Humanities Courses

1. _____ 3. _____
2. _____ 4. _____

LIST II: Social Science Courses

1. _____ 3. _____
2. _____ 4. _____

LIST III: Science Courses

1. _____ 3. _____
2. _____ 4. _____

Not more than 12 courses (36.0 credit hours) may be completed at the 1000 level (or lower) [0500 - 1999] for credit towards the degree, excluding Activity courses (labelled PHAC and MUSE).

1. _____ 7. _____
2. _____ 8. _____
3. _____ 9. _____
4. _____ 10. _____
5. _____ 11. _____
6. _____ 12. _____ (max.)

Completion of at least 15 courses (45.0 credit hours) from disciplines offered by the Faculty of Arts and Science or the Faculty of Fine Arts at the 3000/4000 level, excluding Activity courses (labelled PHAC and MUSE).

1. _____ 9. _____
2. _____ 10. _____
3. _____ 11. _____
4. _____ 12. _____
5. _____ 13. _____
6. _____ 14. _____
7. _____ 15. _____ (min.)
8. _____

_____ Not more than five Independent Study courses (15.0 credit hours) may be completed for credit towards the degree.

_____ Not more than five Disciplinary Credit Applied Studies courses (15.0 credit hours) may be completed for credit towards the degree. Students may, in addition, complete Applied Studies 2000, 2001, 2010, and 2011.

_____ Not more than 24 courses (72.0 credit hours) may be completed from any one discipline for credit towards the degree.
Note: *Disciplines are identified by a specific course label (e.g. KNES, ASTR, and HIST are separate disciplines).*

_____ Not more than six credit hours in Activity courses (i.e. courses labelled PHAC and MUSE) may be completed for credit towards the degree, except for Kinesiology majors (not more than 15.0 credit hours) and Music majors (not more than 12.0 credit hours).

_____ Not more than four courses (12.0 credit hours) from disciplines offered outside the Faculty of Arts and Science or the Faculty of Fine Arts may be completed for credit towards the degree (i.e. labelled ADCS, CDEV, CRED, EDUC, HLSC, MGT, NURS, and PUBH). Courses cross-listed between the Faculty of Arts and Science and another Faculty do not count towards this limit.

_____ Residence requirement:

Degree: at least 20 courses (60.0 credit hours) must be completed at the University of Lethbridge, including the last 10 courses (30.0 credit hours) completed for credit towards the degree.

Major: at least half of the courses required in the major must be completed at the University of Lethbridge.

Minor (Optional): _____
See the 2015/2016 Calendar, p. 137*, for eligible minors.*

1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

Sample Sequencing Plan

Shown below is a sample sequence of courses for your degree. If you follow this plan, you should be able to graduate in four years, provided you complete five courses per semester. This is just one example of how you could complete your major and degree requirements; you may find that a different sequence works as well as this one.

Year 1, Fall	***Year 1, Spring***
Biology 1010 or Biology 1020	Mathematics 2560
Mathematics 1410	Physics 2000
Mathematics 1560 [1]	Physics 2130
Physics 1000 or Physics 1050	Computer Science 1620
GLER course	GLER course
Year 2, Fall	***Year 2, Spring***
Chemistry 1000	Mathematics 2580
Mathematics 2570	Physics 2150
Physics 2120	Physics 2925
Physics 2800	GLER course
GLER course	GLER course
Year 3, Fall	***Year 3, Spring***
Physics 3150	Physics 3400
Physics 3175	Physics 3750
Physics 3200	Physics 3800
Physics 3925	GLER course
GLER course	GLER course
Year 4, Fall	***Year 4, Spring***
Physics 4175	Physics 4150 or Physics 4200
Physics 3000/4000 level	Physics 3000/4000 level
Elective 3000/4000 level	Elective 3000/4000 level
Elective 3000/4000 level	Elective 3000/4000 level
Elective	Elective

[1] *Students with less than 75% in Mathematics 30-1 or without Mathematics 31 must complete MATH 1010 as a prerequisite.*

Note: *Students are strongly advised to consult with the Department of Physics and Astronomy regarding the sequencing of courses.*

Terms Used

GLER course: A course that could count toward the General Liberal Education Requirement. You may use courses in your major towards this 12-course requirement. See the 2015/2016 University of Lethbridge Calendar, Part 4 - Academic Regulations (p. 83) for complete information.

The Faculty of Arts and Science offers Liberal Education 1000 and 2000, specifically designed to introduce first-year students to the wide scope of human knowledge and teach essential university success skills, critical thinking, and integrative thinking (see the 2015/2016 University of Lethbridge Calendar, Part 14 - Courses, p. 301). LBED 1000 and 2000 may be used toward satisfying the GLER.

Elective: A course that you may choose freely from all those available and applicable to your program. Use courses inside or outside your major, bearing in mind any restrictions that may apply (e.g., a maximum of 24 courses from any one discipline).